PLANNING & PROGRAMMING DIVISION

PLANNING RESEARCH SECTION

TRAFFIC ANALYSIS UNIT

TAU 3457

T. H. 95

C.S. 8210

North Limits of Stillwater to
South Limits of Marine on St. Croix

Prepared: November, 1964

MINNESOTA HIGHWAY DEPARTMENT

U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

STATE OF MINNESOTA

DEPARTMENT Highway

Office Memorandum

TO : T. S. Thompson

DATE: November 3, 1964

FROM : Johan Nygaard

SUBJECT: TH 95, C.S. 8210, North Limits of Stillwater to South Limits of Marine on St. Croix

This report is transmitted in response to D. Wenger's request of September 6, 1964 for 1985 ADT, Heavy Commercial ADT, and DHV for the above-mentioned study location shown on the map on page 2.

The map on page 3 presents the current 1963 ADT and the estimate of 1985 ADT in red and blue ink respectively. For each segment numbered on the map on page 3, the following 1985 traffic data are tabulated on page 4.

a) Vehicle Type Distribution
b) Total ADT
c) Total Heavy Commercial ADT
d) Total DHV Without Directional Distribution
e) Directional Distribution of DHV

Basic Data, Method, and Assumptions utilized in the preparation of this 1985 traffic forecast are presented on pages 5, 6, 7, and 8.

This traffic request was initiated by D. Wenger for E.J. McCubrey.

The current 1963 ADT volumes on this route, as shown on the map on page 3, indicate that this route is not heavily traveled as measured on an average annual daily traffic basis. However, summer weekend traffic volumes are substantially higher than the ADT volumes. Thus, Representative Albertson's impressions of high traffic volumes for this route are most probably the result of individual observances of unusually high peak hours and summer weekend travel.

Johan Nygaard

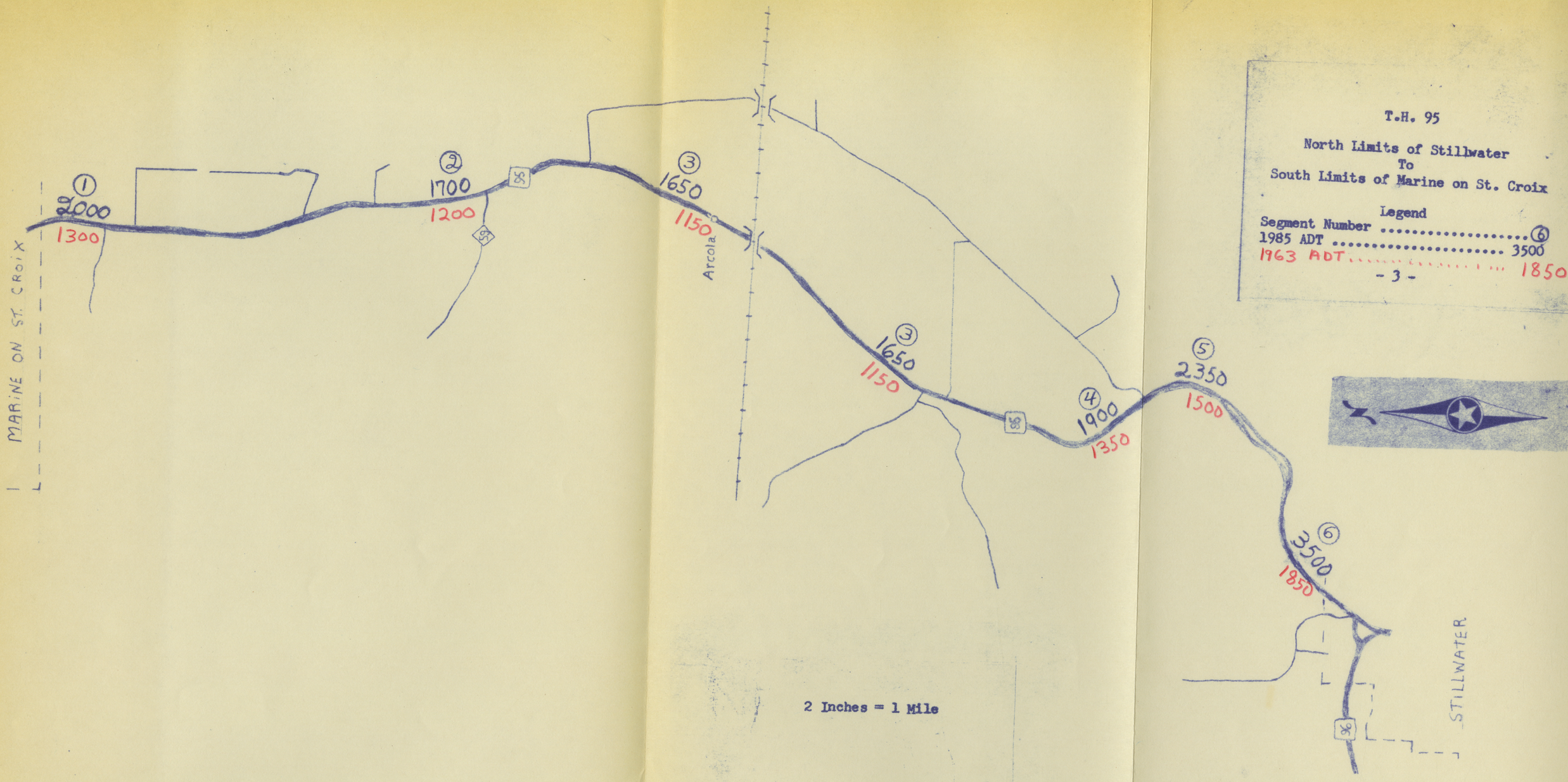
STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS
WORK MAP

Base Map Prepared by the Planning And Programming Division Jan. 1, 1964

T.H. 95

North Limits of Stillwater
To
South Limits of Marine on St. Croix

Legend
Segment Number ..... ⑥
1985 ADT 3500
1963 ADT 1850



2 Inches = 1 Mile

Form 2985 (9-63)

TRAFFIC ESTIMATE DATA

DESIGN YEAR 1985 PART 1 OF 1

FOR

T.H. 95 S.P. 8210 LENGTH - MILES

COUNTY Washington LOCATION North Limits of Stillwater to South Limits of Marine on St. Croix.

BASED ON

1985 ADT FROM TRAFFIC ANALYSIS UNIT

SHOWING

TOTAL ADT ON SEGMENTS 1 THROUGH 6 AS DEFINED ON ATTACHED INDEX MAP

VEHICLE * TYPE	SEGMENT NUMBER										
	1	2	3	4	5	6					
0	1820	1540	1500	1735	2140	3250					
1	122	105	97	110	148	175					
2	20	17	15	17	24	33					
3	5	5	5	5	5	7					
4	10	10	10	10	10	10					
5	20	20	20	20	20	20					
6	3	3	3	3	3	5					
TOTAL ADT	2000	1700	1650	1900	2350	3500					
TOTAL H. COMM. ADT	180	160	150	165	210	250					
TOTAL DHV	360	300	300	350	420	630					
DIRECTIONAL DISTRIBUTION	65-35	65-35	65-35	65-35	65-35	65-35					

* VEHICLE TYPE CODE

0 = PASSENGER CARS AND 4 TIRE TRUCKS
1 = SINGLE UNIT-2 AXLE-6 TIRE TRUCKS
2 = SINGLE UNIT-3 AXLE TRUCKS
3 = TRACTOR-TRUCK OR SEMI-TRAILER- 3 AXLES
4 = TRACTOR-TRUCK OR SEMI-TRAILER - 4 AXLES
5 = TRACTOR-TRUCK OR SEMI-TRAILER - 5 AXLES
6 = BUSES AND TRUCKS WITH TRAILERS

Basic Data, Method, and Assumptions

The 1985 ADT estimate is based upon a normal growth projection reduced by estimated diversions from TH 95 to TH 8 in combination with either Interstate TH 35E or 35W.

The 1985 normal growth projection is based upon a least squares projection to 1985 of the historical ADT recorded for the thirteen year period from 1951 to 1963.

The estimate of the 1985 ADT diversions from TH 95 to TH 8 in combination with either Interstate TH 35E or 35W is based upon an analysis of 735 trip interviews recorded on TH 95 north of TH 97 for a 16 hour August weekday period in 1963.

There were 159 trips between the Minneapolis area and Taylors Falls or Wisconsin. Since most of these trips would enter and leave TH 95 via TH 36, the future junction of TH 36 and TH 35W and the west junction of TH 8 and TH 95 were established as points of choice in the calculation of travel time ratios between the TH 8-35-35W and the TH 95-36 alternatives. With an assumed average running speed of 57 mph on freeways (TH's 35, 35E, 35W), 50 mph on expressways (TH 36), and 42 mph on trunk highways (TH 95, 8), it was estimated that a trip via TH's 8, 35, and 35W between the above-mentioned points of choice could be performed in 80 percent of the travel time required via the TH 95-36 alternative. With a travel time ratio of 80 percent, it is estimated that 75 percent of the trips would divert to the quicker alternative.

There were 150 trips between the St. Paul area and Taylors Falls or Wisconsin. Since most of these trips would enter and leave TH 95 via TH 36, the junction of TH 36 and TH 35E and the west junction of TH 8 and TH 95 were established as points of choice in the calculation of travel time ratios between the TH 8-35-35E and the TH 95-36 alternative. Using the average running speeds assumed in the preceding paragraph, it was estimated that a trip via TH's 8, 35, and 35E between the above-mentioned points of choice could be performed in 84 percent of the travel time required via the TH 95-36 alternative. With a travel time ratio of 84 percent, it is estimated that 67 percent of the trips would divert to the quicker alternative.

These diversions were factored to a 1963 ADT basis, and subsequently projected to 1985 ADT on the basis of a least squares projection of the historical ADT recorded at the location of the interview station. An estimate of 650 ADT diversions from TH 95 to TH 8 in combination with either Interstate TH 35E or 35W was obtained for 1985.

Thus, the 1985 ADT estimate obtained from a normal growth projection of historical ADT was reduced by a normal growth projection of the estimate of diversions from TH 95. The 1985 ADT forecast is summarized for the high and low 1985 ADT volume segments as follows:

	High Segment North Limits of Stillwater	Low Segment South of C.R. 59
1985 ADT from Normal Growth Projections	4150	2300
1985 ADT Diversions to TH's 8, 35, 35E or 35W	650	650
1985 ADT Estimate Reflecting Normal Growth Minus Diversions	3500	1650
1963 ADT	1850	1150

Since the 1985 ADT estimates in the above tabulation are based upon least squares projections of historical ADT recorded from 1951 to 1963, the implicit assumption in this forecast is that the causal factors determining the rate of traffic growth in this period will, in the future, continue to operate in a similar manner to 1985. With the completion of the interstate system, many of the through trips presently on the study section of TH 95 will divert to TH 8 in combination with either TH 35E or 35W. In 1985, consequently, TH 95 will primarily provide local trips with an access to the adjacent area. The area growth of population is one of the principal factors determining the growth of local traffic. If in the period to 1985, the population of the area served by the study section of TH 95 increases at an accelerated rate relative to the rates observed from 1950 to 1960, concurrently there would occur an accelerated rate of traffic growth relative to the rate of traffic growth estimated from a linear projection of 1951 to 1963 ADT.

Consequently, 1985 population estimates were obtained from our Economic Study Unit and analyzed for the area served by the study section of TH 95. The following tabulation presents 1950, 1960, and estimated 1985 population data for Stillwater township, May township, and Marine on St. Croix.

	Stillwater Township	May Township	Marine on St. Croix	TOTAL
1950 Population Census	548	561	334	1443
1960 Population Census	822	755	454	2031
1985 Population Estimate	1500	1200	700	3400
1950-1960 Average Yearly Population Increase	27	19	12	58
1960-1985 Estimate of Average Yearly Population Increase	27	18	10	55

The Economic Study Unit's 1985 population forecast was made by determining future residential area and the number of dwelling units in this area at saturation.

A percentage, based, upon a study of past growth trends and an analysis of aerial photography of residential development in outlying suburban areas were used to determine 1985 development of saturation. The number of estimated 1985 dwelling units in this area was multiplied by 4.0, the average number of persons per household in the outlying suburban areas. It should be pointed out that this 1985 population forecast is still only tentative. However, no significant revision of this 1985 forecast is anticipated.

For each of the areas adjacent to the study section of TH 95, the estimated average yearly population increments for the period from 1960 to 1985 are about the same as those of the period from 1950 to 1960.

The low yearly average population increments forecasted for this area is a result of slower development caused by terrain unfavorable to mass development, inaccessibility to central cities, and more attractive residential development in other suburban areas.

Since the tentative 1985 population forecast predicts slow and gradual residential development with average yearly population increases similar to those observed for the period from 1950 to 1960, no significant acceleration in the rate of traffic growth from 1963 to 1985 is expected relative to the rate of traffic growth obtained from a linear projection to 1985 of 1951 to 1963 ADT.

The request initiating this traffic forecast specified "1985 or 1990 volume on TH 95". Since no population forecast is available for 1990, it was necessary to select 1985 as the forecast year.

Although no population forecast of the study area is available for 1990, from an analysis of the population growth of the entire metropolitan area and the estimate of the time required for each of the outlying areas to approach saturation of development, there is good reason to expect that the more attractive suburban areas presently competing with the study areas for residential development will by 1985 approach saturation levels. Consequently, beyond 1985, there is a good reason to expect the study area to be in a more favorable competitive position in the attraction of future residential development. Therefore, beyond the tentative 1985 population forecast, the population growth is extremely difficult to predict.

If as expected, the rate of population growth from 1985 to 1990 accelerates beyond the past and forecasted rates of growth, the rate of traffic growth would also accelerate. Thus, no reliable 1990 traffic forecast can be made for such a route so close to the ever expanding periphery of residential development without a 1990 population forecast.

The 1985 vehicle type distribution and heavy commercial ADT was based upon a 16-hour weekday vehicle classification count recorded in 1963 on TH 95 north of the junction with TH 97. This classification count was adjusted to a 24 hour weekday and expanded to 1963 ADT by vehicle type. It was subsequently projected to 1985 ADT by statewide trends in vehicle type.

The 1985 DHV for segment 6 is 630. This was obtained by applying an estimate of DHV as a percentage of ADT to the 1985 ADT. Normally, the DHV occurs on a weekend in July or August. However, weekend traffic counts on TH 95 are abailable only for one week in April. Thus, it was necessary to estimate the DHV as a percentage of ADT by relating the pattern of Weekday, Saturday, and Sunday traffic counts recorded in April on TH 95 to similar daily patterns within the April traffic data recorded at continuously operated automatic traffic recorders. Had the request initiating this traffic forecast been received before Labor Day, traffic counts on TH 95 would have been taken over the heavily traveled Labor Day weekend.

From an examination of each of the daily patterns within April traffic data recorded at 31 continuously operated automatic traffic recorders, only 3 were found to have April traffic patterns similar to those on TH 95. The following tabulation presents April averages of Saturday, Sunday, Weekend, and April ADT as a percentage of average April weekdays. The percentage relationships within each of the 3 patterns of April traffic data selected for comparison with TH 95 are very similar to the April traffic pattern analyzed on TH 95. Moreover, the DHV as a percentage of the ADT was found to be very close for each of the 3 automatic traffic recorders.

	TH 95, South of TH 96	TH 61, North of Wyoming	TH 61, SW of Knife River	TH 10, NW of Anoka
Average April Weekday	100%	100%	100%	100%
Average April Saturday	135%	140%	153%	127%
Average April Sunday	168%	164%	147%	164%
Average April Weekend	151%	152%	150%	146%
April ADT	115%	115%	114%	113%
DHV as a percent of ADT		17.7%	17.1%	16.3%

The above tabulation would seem to indicate that the DHV percentage on TH 95 should be similar to those obtained on other routes with similar patterns of April traffic. Thus, it was estimated that the 1985 DHV on TH 95 would be 18 percent of the 1985 ADT. This estimate is considerably higher than the low DHV volumes estimated on most other routes in the vicinity of the Twin Cities. In fact, this high DHV percent is typical of northern recreational routes. However, the study section of TH 95 provides access to some of the best recreational areas near the Twin Cities. For example, TH 95 is a principal route of access to the many and varied recreational activities on the St. Croix River and St. Croix Islands. It is the major route to the William O'Brien State Park, and one of the two major routes to the Interstate Park at Taylors Falls and St. Croix Falls.

The directional distribution of the 1985 DHV is estimated at 65-35, a typical split on a recreational route.

The graph presented on page 9 is another example of the substantial daily variation in traffic volume on TH 95. The traffic data presented in the graph for TH 95 was recorded south of the study section, consequently, the actual hourly volumes are not relevant as they include traffic increments from TH 96 and internal Stillwater traffic. Nevertheless, the graph presents a good illustration of the relative daily variation in April traffic volumes on TH 95. If traffic data were available for an entire week in July or August, the weekend variation in traffic volumes would appear even more significant.

Therefore, while 1963 ADT volumes on TH 95 do not indicate that it is a heavily traveled route, summer weekend traffic volumes on this recreational route are substantially higher than the ADT volumes.